

Supplementary Table S1 Characteristics of SES studies for ESCC in population of India and worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Sample size (case/control)	Study design	Adjustment factors
Indian study									
Graduates and higher	OR=0.19 4/115	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, religion, daily fresh fruit and vegetable intake, cumulative use of cigarettes, hookah, and nass, and ever-use of bidi, gutka, and alcohol. Results for education were additionally adjusted for the wealth score. Results for other variables in the table were additionally adjusted for education
Monthly income (> 10,000)	OR = 0.99 60/290	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
Cooking fuel (electricity)	OR = 0.24 3/32	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
Cooking fuel (gas)	OR = 0.10 13/266	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
Wealth score (5th Quintile)	OR = 0.29 58/332	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
International studies-SES									
Married	OR = 0.41 197/446	Islami et al	2009	19416955	Iran	ESCC	300/571	Case control	Ethnicity, daily vegetable intake, alcohol consumption, tobacco or opium ever use, duration of residence in rural areas, education level, marital status and wealth score. When one of these possible confounders was the variable of interest, the adjustments were made for the other possible confounders
Middle school or higher education	OR = 0.20 8/33	Islami et al	2009	19416955	Iran	ESCC	300/571	Case control	
Wealth score (5th quintile)	OR 0.64 43/118	Islami et al	2009	19416955	Iran	ESCC	300/571	Case control	
Men (never married)	IRR = 2.06	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	Age, calendar period, region of residence, marital status, education, and income
Men(divorced) ≥5 years	IRR = 2.31	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Men (widowed) ≥5 years	IRR = 1.71	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Highest education level (men)	IRR = 0.65	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Highest income group (men)	IRR = 0.55	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Women (never married)	IRR = 1.75	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Women(divorced) ≥5 years	IRR = 1.87	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Women (widowed) ≥5 years	IRR = 1.58	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Highest education level (women)	IRR = 0.74	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Highest income group (women)	IRR = 0.83	Lagergren et al	2016	26447737	Sweden	ESCC	3,531	Cohort	
Highest education (secondary school and above)	OR = 0.60 81/156	Gao et al	2018	29467939	China	ESCC	1,298/1,900	Case control	
Wealth score (5th quintile)	OR = 0.43 130/361	Gao et al	2018	29467939	China	ESCC	1,298/1,900	Case control	
House area per person (> 70 meter square)	OR = 0.71 359/637	Gao et al.	2018	29467939	China	ESCC	1,298/1,900	Case control	
Cooking fuel gas or electricity	OR = 0.65 215/447	Gao et al	2018	29467939	China	ESCC	1,298/1,900	Case control	

Abbreviations: CI, confidence interval; ESCC, esophagus squamous cell carcinoma; IRR, incidence rate ratio; OR, odds ratio; SES social economic status.

Supplementary Table S2 Characteristics of hot beverages/food studies for ESCC in population of India and worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Study sample size (case/control)	Study design	Adjustment factors
Indian study									
Hot Salt tea drinking OR(1)	OR = 1.27 428/803	Dar et al	2015	25209106	India	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, income, gender education, the wealth score, fruit and vegetable intake, ever use of bidi, gutka, and alcohol, and cumulative use of hookah, cigarette and nass
Hot Salt tea drinking OR(2)	OR = 0.98 428/803	Dar et al	2015	25209106	India	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, income, gender education, the wealth score, fruit and vegetable intake, ever use of bidi, gutka, and alcohol, and cumulative use of hookah, cigarette and nass, use of milk, vessel used, roti and cereal paste consumption, adding baking soda to alkaline tea, consumption of alkaline tea only
International studies									
Interval between tea being poured and drunk (minutes)									
≥4	OR = 1.0 132/394	Islami et al	2009	19325180	Iran	ESCC	300/571	Case control	Ethnicity, daily vegetable intake, alcohol consumption, tobacco or opium ever use, duration of residence in rural area, education level, car ownership, and variables listed in table, excluding interval variable; interval variable was not adjusted for tea temperature
2–3	OR = 2.49 112/138	Islami et al	2009	19325180	Iran	ESCC	300/571	Case control	
<2	OR = 5.41 54/35	Islami et al	2009	19325180	Iran	ESCC	300/571	Case control	
<2	HR = 1.51	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	Age at baseline, gender, urban–rural residence, ethnicity, education level, wealth score, fresh fruit and vegetable consumption, cigarette smoking, nass chewing, opium use, and alcohol consumption. tea drinking variables: measured and perceived temperature and interval variables were additionally adjusted for black tea and green tea consumption; tea consumption variables were additionally adjusted for the measured tea temperature (≥60 C, 60–64 C, and ≥65 C), and black tea and green tea consumption were also adjusted for the consumption of the other type of tea
2–4	HR = 1.22	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	
5	HR = 0.83	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	
Self-perceived									
Very hot tea	OR = 8.16 63/19	Islami et al	2009	19325180	Iran	ESCC	300/571	Case control	Ethnicity, daily vegetable intake, alcohol consumption, tobacco or opium ever use, duration of residence in rural areas, education level, car ownership, and variables listed in table, excluding interval variable; interval variable was not adjusted for tea temperature
Hot tea	OR = 2.07 108/155	Islami et al	2009	19325180	Iran	ESCC	300/571	Case control	

(Continued)

Supplementary Table S2 (Continued)

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Study sample size (case/control)	Study design	Adjustment factors
Very hot tea	HR = 2.41	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	Age at baseline, gender, urban-rural residence, ethnicity, education level, wealth score, fresh fruit and vegetable consumption, cigarette smoking, nass chewing, opium use, and alcohol consumption. tea drinking variables: measured and perceived temperature and interval variables were additionally adjusted for black tea and green tea consumption; tea consumption variables were additionally adjusted for the measured tea temperature, and black tea and green tea consumption were also adjusted for the consumption of the other type of tea
Hot tea	HR = 0.92	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	
Less than daily consumption of tea (in alcohol and tobacco users)	HR = 2.47	Yu et al	2018	29404576	China	EC (91% ESCC)	456,155	Cohort	Age, education, marital status, household income, physical activity, intakes of red meat, fresh fruits and vegetables, and preserved vegetables, body mass index, family history of cancer, and menopausal status. Multivariable model was further adjusted for tobacco smoking and alcohol consumption
Daily warm tea	HR = 4.59	Yu et al	2018	29404576	China	EC (91% ESCC)	456,155	Cohort	Age at baseline, gender, urban-rural residence, ethnicity, education level, wealth score, fresh fruit and vegetable consumption, cigarette smoking, nass chewing, opium use, and alcohol consumption. tea drinking variables: measured and perceived temperature and interval variables were additionally adjusted for black tea and green tea consumption; tea consumption variables were additionally adjusted for the measured tea temperature, and black tea and green tea consumption were also adjusted for the consumption of the other type of tea
Daily burning hot tea	HR = 5.01	Yu et al	2018	29404576	China	EC (91% ESCC)	456,155	Cohort	
Very hot (most frequent beverage)	OR = 3.66 91/30	Middleton et al	2018	30496610	Kenya	ESCC	430/440	Case control	Gender, study phase, interviewer adjusted for tobacco and alcohol consumption, estimated grams of ethanol per day, family history of EC, education level and number of daily tobacco smokes/chews
Hot (most frequent beverage)	OR 1.4 252/298	Middleton et al	2018	30496610	Kenya	ESCC	430/440	Case control	
Very hot tea	OR = 2.15 102/75	Yang et al	2018	30310324	China	ESCC	1,355/1,962	Case control	Age, marital status, education, occupation, family wealth score, body mass index 10 years ago, sum of missing and filled teeth, number of tooth brushing per day, smoking pack-years, alcohol consumption intensity and family history of esophageal cancer among first-degree relatives
Hot tea	OR = 1.47 175/210	Yang et al	2018	30310324	China	ESCC	1,355/1,962	Case control	

Supplementary Table S2 (Continued)

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Study sample size (case/control)	Study design	Adjustment factors
Hot mate	OR = 1.61 417/914	Lubin et al	2014	24130226	Brazil	ESCC	2,111/2,484	Case control	Smoking, alcohol consumption, age, gen- der, gender by education, and for Uruguay income and urban/rural residence. Pooled ORs further adjusted for study
Very hot mate	OR = 2.15 120/202	Lubin et al	2014	24130226	Brazil	ESCC	2,111/2,484	Case control	
Measured tea temperature (°C)									
≥60	HR = 1.41	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	Age at baseline, gender, urban–rural resi- dence, ethnicity, education level, wealth score, fresh fruit and vegetable consump- tion, cigarette smoking, mass chewing, opium use, and alcohol consumption. tea drinking variables: measured and perceived temperature and interval variables were additionally adjusted for black tea and green tea consumption, tea consumption variables were additionally adjusted for the measured tea temperature, and black tea and green tea consumption were also ad- justed for the consumption of the other type of tea
60–64	HR = 1.44	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	
≥65	HR = 1.36	Islami et al	2019	30891750	Iran	ESCC	50,027	Cohort	
Temperature of tea									
Low or mild (<60°C)	OR = 1.0 129/147	Tai et al	2017	29390400	China	ESCC	167/167	Case control	Age, gender, education, marital status, household income, physical activity, intakes of red meat, fresh fruits and vegetables, and preserved vegetables, body mass index, and family history of cancer
High (≥60°C)	OR = 2.23 38/20	Tai et al	2017	29390400	China	ESCC	167/167	Case control	
Temperature of water									
Low or mild (<60°C)	OR = 1.0 125/143	Wei-Ping Tai et al	2017	29390400	China	ESCC	167/167	Case control	
High (≥60°C)	OR = 2.13 42/24	Tai et al	2017	29390400	China	ESCC	167/167	Case control	
Temperature of food									
Low or mild (<60°C)	OR = 1.0 140/157	Tai et al	2017	29390400	China	ESCC	167/167	Case control	
High (≥60°C)	OR = 2.98 27/10	Tai et al	2017	29390400	China	ESCC	167/167	Case control	
Hot beverages and food	OR = 1.6	Chen et al	2015	26031666	Africa, China, India, the United States	ESCC	26 reports	Meta-analysis (case control or cohort)	

Abbreviations: CI, confidence interval; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; HR, hazard ratio; OR, odds ratio.

Supplementary Table S3 Characteristics of Diet studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Sample size (case/ control)	Study design	Adjustment factors
Indian study-diet									
Weekly fruit consumption	(X ² Yates corrected) 18.1	Khan et al	2011	21546736	India	ESCC	100/100	Case control	Not mentioned
International studies-diet									
Salted meat intake (ever)	OR = 2.33 897/835	Lin et al	2014	25544988	China	ESCC	942/942	Case control	Age, gender, marital status, household income, BMI, family cancer history, smoking, alcohol drinking, intake of pickled and preserved vegetables, fresh vegetable, fruit intake and total energy intake
Fried meat	OR = 3.34 266/430	Golozar et al	2016	25851181	Iran	ESCC	300/571	Case control	Ethnicity, education, wealth score, opium use, tobacco smoking, family history of ESCC, BMI categories, tea drinking temperature, vegetable intake, DMFT categories and eating discomfort frequency
Fried fish	OR = 2.62 150/244	Golozar et al	2016	25851181	Iran	ESCC	300/571	Case control	
Red meat (176–268 g/day)	OR = 2.13 64/134	Golozar et al	2016	25851181	Iran	ESCC	300/571	Case control	
Red meat (>269 g/day)	OR = 2.82 81/117	Golozar et al	2016	25851181	Iran	ESCC	300/571	Case control	
Calcium, per 100-mg/d increase(continuous variable)	HR = 0.88	Hashemian et al	2015	26016858	Iran	ESCC	47,405 (200 cases)	Cohort	Age, gender, total energy, place of residence, smoking, wealth score, ethnicity, opiate use, BMI, education, marital status, physical activity score, and fruit and vegetable intakes
Frequency of intake of preserved vegetable (<=3 time per week)	OR = 1.10 72/80	Song et al	2012	22827896	China	ESCC	254/254	Case control	Other two processed foods, age, smoking, alcohol drinking, fruit and vegetable consumption, family esophageal cancer history and annual per capita income
Frequency of intake of preserved vegetable (>3 time per week)	OR = 5.01 92/26	Song et al.	2012	22827896	China	ESCC	254/254	Case control	
Frequency of intake of pickled vegetable (<1 time per day)	OR = 1.18 29/33	Song et al	2012	22827896	China	ESCC	254/254	Case control	
Frequency of intake of pickled vegetable (>1 time per day)	OR = 0.66 169/164	Song et al	2012	22827896	China	ESCC	254/254	Case control	
Frequency of salted meat (<1 time a week)	OR = 1.79 81/105	Song et al	2012	22827896	China	ESCC	254/254	Case control	
Frequency of salted meat (>1 time a week)	OR = 2.57 126/81	Song et al	2012	22827896	China	ESCC	254/254	Case control	
All spicy food	OR = 1.43	Chen et al	2017	28875961	India, China, Australia, Hungary, Korea, Siberia, Egypt, Yemen, Malaysia	EC	9 studies	Meta-analysis, case control	Multivariate models from each contributing study
All vegetable 4th Quartile (g/day)	RR = 1.36	Steevens et al	2011	21960262	The Netherland	ESCC	4035 (ESCC 101)	Cohort	Age, gender, cigarette smoking duration, alcohol consumption, red meat consumption, fish consumption

Abbreviations: CI, confidence interval; DMFT, decayed, missing, and filled teeth; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; HR, hazard ratio; OR, odds ratio; RR, relative risk.

Supplementary Table S4 Characteristics of Indoor air pollution studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location/ setting	Case type	Sample size (case/control)	Study design	Adjustment factors
Indian study-indoor air pollution									
Cooking fuel (electricity)	OR = 0.24 3/32	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, religion, daily fresh fruit and vegetable intake, cumulative use of cigarettes, hookah, and nass, and ever-use of bidi, gutka, and alcohol. Results for education were additionally adjusted for the wealth score. Results for other variables in the table were additionally adjusted for education
Cooking fuel (gas)	OR = 0.10 13/266	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
International studies-indoor air pollution									
Cooking method (wood)	OR = 12.6 66/13	Mlombe et al	2015	26715952	Africa	ESCC	96/180	Case control	Age, gender, socioeconomic status, cooking methods, and smoking. The odds ratios for maize storage and type of maize flour have been further adjusted for source of maize
Exposure to indoor air pollution (using indoor nongas fuel without chimneys), continued using nongas without chimney	HR = 1.57	Sheikh et al	2019	30611753	Northeastern Iran	ESCC	50,045 individuals	Cohort	Age, gender, residence counties, ethnicity, quartiles of the socioeconomic status, opium consumption through smoking, opium consumption through ingestion, drinking hot tea at $\geq 60^{\circ}\text{C}$ daily intake of fruits, daily intake of vegetables, drinking un-piped water, exposure to indoor air pollution, daily contact with ruminants, alcohol drinking, cigarette smoking, nass chewing

Abbreviations: CI, confidence interval; ESCC, esophagus squamous cell carcinoma; HR, Hazard ratio; OR, Odds ratio.

Supplementary Table S5 Characteristics of uniped water studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location/ setting	Case type	Sample size (case/ control)	Study design	Adjustment factors
International studies-uniped water									
Pipe-borne drinking water	OR = 5.62 27/65	Talagala et al	2018	30454012	Sri Lanka	EC	49/196 (unmatched controls)	Case control	Adjusted for possible confounders, but not mentioned the confounders
Uniped water	OR = 4.25 76/54	Golozar et al	2016	25851181	Iran	ESCC	300/571	Case control	Ethnicity, education, wealth score, opium use, tobacco smoking, family history of ESCC, BMI categories, tea drinking temperature, vegetable intake, DMFT categories and eating discomfort frequency
Continuous drinking of uniped water	HR = 2.04	Sheikh et al	2019	30611753	Northeastern Iran	ESCC	50,045 individuals	Cohort	Age, gender, residence counties, ethnicity, quartiles of the socioeconomic status, opium consumption through smoking, opium consumption through ingestion, drinking hot tea at $\geq 60^{\circ}\text{C}$, daily intake of fruits, daily intake of vegetables, drinking uniped water, Exposure to indoor air pollution, daily contact with ruminants, alcohol drinking, cigarette smoking, nass chewing
Well	OR = 1.9 97/89	Menya et al	2019	30582155	Africa	ESCC	430/440	Case control	Gender, ethnicity, alcohol tobacco, alcohol intensity, very hot/ hot/warm beverage drinking, family history of EC, and continuous: age, education score. Tooth brushing frequency + brush type + DMFT (not for lost/decayed teeth), leukoplakia
Spring/river	OR = 3.1 113/61	Menya et al	2019	30582155	Africa	ESCC	430/440	Case control	
Borehole	OR = 0.7 35/68	Menya et al	2019	30582155	Africa	ESCC	430/440	Case control	

Abbreviations: CI, confidence interval; DMFT, decayed, missing, and filled teeth; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; HR, hazard ratio; OR, odds ratio.

Supplementary Table S6 Characteristics of obesity studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case control	Study	Year	PMID	Location/setting	Case type	Sample size (case/control)	Study design	Adjustment factors
International studies-obesity									
BMI (kg/m ²) obese (ESCC)/men	HR = 0.52	Sanikini et al	2020	31050823	The United Kingdom	EC (EAC, ESCC) and GC	476,160 anthropometric-men	Cohort	Age, center and adjusted for smoking, education level and alcohol intake
WHR (ESCC) >0.96/men	HR = 1.26	Sanikini et al	2020	31050823	The United Kingdom	EC (EAC, ESCC) and GC	476,160 anthropometric-men	Cohort	
BMI (kg/m ²) obese (ESCC)/women	HR = 0.50	Sanikini et al	2020	31050823	The United Kingdom	EC (EAC, ESCC) and GC	476,160 anthropometric-women	Cohort	
WHR (ESCC) >0.82/women	HR = 0.73	Sanikini et al	2020	31050823	The United Kingdom	EC (EAC, ESCC) and GC	476,160 anthropometric-women	Cohort	
Being very obese at ages 15 and 30 (women)	OR = 3.6 18/14	Etemadi et al	2012	22052987	Golestan	ESCC	300/571	Case control	Education, family history of esophageal cancer, smoking history, opium use, age of first adult tooth loss, and use of piped water, with models at 15 adjusted for childhood place of residence. Body size analyses also adjusted for physical activity at the same age and vice versa
Being very obese at ages 15 and 30 years (men)	OR = 0.5 5/14	Etemadi et al	2012	22052987	Golestan	ESCC	300/571	Case control	

Abbreviations: BMI, body mass index; CI, confidence interval; EAC, esophagus adenocarcinoma; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; GC, gastric cancer; HR, hazard ratio; OR, odds ratio; WHR, waist-to-hip ratio.

Supplementary Table S7 Characteristics of dental fluorosis studies for ESCC in population of worldwide

Exposure	Risk estimates (95 %CI) Case/control	Study	Year	PMID	Location/setting	Case type	Sample size (case/control)	Study design	Adjustment factors
International studies-dental fluorosis									
Dental fluorosis (moderate/severe)	OR = 4.9 127/22	Menya et al	2019	30582155	Africa	ESCC	430/440	Case control	Gender, ethnicity, alcohol + tobacco (combined), alcohol intensity, very hot/hot/warm beverage drinking, family history of EC, age, education score. Tooth brushing frequency + brush type +DMFT, leukoplakia
Dental fluorosis (mild)	OR = 1.7 122/129	Menya et al	2019	30582155	Africa	ESCC	430/440	Case control	

Abbreviations: CI, confidence interval; ESCC, esophagus squamous cell carcinoma; OR, odds ratio.

Supplementary Table S8 Characteristics of Heavy metals studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI)	Study	Year	PMID	Location/setting	Case type	Sample size	Study design	Adjustment factors
International studies–heavy metals									
Nickel (spatial regression analysis)	$\beta = 4.9$	Lee et al	2016	27698910	Taiwan	EC	209	Prevalence	NA
Lead (Spatial regression analysis)	$\beta = 1.5$	Lee et al	2016	27698910	Taiwan	EC	209	Prevalence	NA
Cadmium	HRI = 0.29	Zafarzadeh et al	2018	NA	Iran	EC (endemic region)	120 (vegetables studied)	Prevalence	NA
Lead	HRI = 0.91	Zafarzadeh et al	2018	NA	Iran	EC (endemic region)	120 (vegetables studied)	Prevalence	NA

Abbreviations: β , beta coefficient; CI, confidence interval; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; HRI, heavy metal health risk NA, not available.

Supplementary Table S9 Characteristics of HPV studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI)	Study	Year	PMID	Location	Case type	Sample size	Study design
International study–HPV								
HPV 16 and 18 (China)	RR = 1.62	Wang et al	2016	27409078	China	EC	33 case control studies	Meta-analysis
HPV 16 and 18 (Non-China)	RR = 1.80	Wang et al	2016	27409078	China	EC	33 case control studies	Meta-analysis
HPV 16 and 18 (Asia/non-Asia)	RR = 1.62	Wang et al	2016	27409078	China	EC	33 case control studies	Meta-analysis
HPV 16	OR = 6.36	Zhang et al	2015	25777422	China	ESCC	10 case control studies	Meta-analysis
HPV 16	OR = 3.55	Yong et al	2013	23916383	China	ESCC	68 case control studies	Meta-analysis
HPV 18	OR = 1.25	Yong et al	2013	23916383	China	ESCC	68 case control studies	Meta-analysis

Abbreviations: CI, confidence interval; EC, esophagus cancer; ESCC, esophagus squamous cell carcinoma; HPV, human papillomavirus; OR, odds ratio; RR, relative risk.

Supplementary Table S10 Characteristics of occupation studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case/control	Study	Year	PMID	Location	Case type	Sample size (case/control)	Study design	Adjustment factors
Indian study-occupation									
High level of occupation physical activity (OPA)	OR = 2.17 167/157	Shah et al	2019	Not found	Kashmir	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, religion, education, daily fresh fruit and vegetable intake, wealth score, monthly income, cu- mulative use of cigarettes, hookahs and nass, and ever-use of bidi, gutka and alcohol, ex- posure to passive smoking, family history of any cancer, oral hygiene, consumption of salt tea, contact with animals
Frequency of strenuous work ≤5 days/week	OR = 3.52 120/67	Shah et al	2019	Not found	Kashmir	ESCC	703/1,664	Case control	
Intensity of work (strenuous)	OR = 3.64 126/74	Shah et al	2019	Not found	Kashmir	ESCC	703/1,664	Case control	
Skilled work	OR = 1.86 48/83	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	Age, ethnicity, place of residence, religion, daily fresh fruit and vegetable intake, cumu- lative use of cigarettes, hookah, and nass, and ever-use of bidi, gutka, and alcohol. Results for education were additionally adjusted for the wealth score. Results for other variables in the table were additionally adjusted for education
Housework	OR = 1.16 266/611	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
Physically very active	OR = 5.65 167/157	Dar et al	2013	23721087	India	ESCC	703/1,664	Case control	
International study									
Professional job	OR = 1.16 64/99	Gao et al	2018	29467939	China	ESCC	1,298/1,900	Case control	Age, gender, place of residence, marital sta- tus, family history of esophageal cancer among first-degree relatives, smoking, alco- hol drinking, tea drinking, body mass index of 10 years ago, sum of missing and filled teeth, and daily frequency of brushing teeth., edu- cation and total wealth score. Since total wealth score has captured information of appliance ownership, job, house area per person and cooking fuel, when analyzing these variables, the adjustment did not in- clude total wealth score
Physical labor (very active)	OR = 1.69 1,092/1,347	Gao et al	2018	29467939	China	ESCC	1,298/1,900	Case control	

Abbreviations: CI, confidence interval; ESCC, esophagus squamous cell carcinoma; OR, odds ratio.

Supplementary Table S11 Characteristics of ruminants studies for ESCC in population of worldwide

Exposure	Risk estimates (95 % CI) Case control	Study	Year	PMID	Location/ setting	Case type	Sample size (case/control)	Study design	Adjustment factors
India-contact with animals									
Daily close contact (animals)	OR = 5.99	Dar et al	2014	24406322	India	ESCC	703/1664	Case control	Age, gender, region, SES
Duration of contact >50 years	OR = 3.10	Dar et al	2014	24406322	India	ESCC	703/1664	Case control	Age, gender, region, SES
International studies-contact with animals									
Contact with canines ever	OR = 1.99 199/280	Nasrollahzadeh et al	2015	25082448	Iran	ESCC	300/571	Case control	Education, ethnicity, opium and tobacco use, alcohol consumption, source of drinking water, use of animal waste as fuel, family history of cancer, and tea drinking habit
Contact with ruminants ever	OR = 7.63 266/365	Nasrollahzadeh et al	2015	25082448	Iran	ESCC	300/571	Case control	
Contact with equine ever	OR = 0.96 160/297	Nasrollahzadeh et al	2015	25082448	Iran	ESCC	300/571	Case control	
Contact with poultry ever	OR = 0.96 246/462	Nasrollahzadeh et al	2015	25082448	Iran	ESCC	300/571	Case control	